UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,285	03/16/2004	Vijayalakshmi R. Raveendran	030065	3631

23696   7590   05/06/2010
QUALCOMM INCORPORATED
5775 MOREHOUSE DR.
SAN DIEGO, CA 92121

EXAMINER
RASHID, DAVID

ART UNIT	PAPER NUMBER
2624	

NOTIFICATION DATE	DELIVERY MODE
05/06/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

us-docketing@qualcomm.com
kascanla@qualcomm.com
nanm@qualcomm.com

	Application No.	Applicant(s)
Office Action Summary	10/802,285	RAVEENDRAN ET AL.
	Examiner	**Art Unit**	
	DAVID P. RASHID	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2010*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,7-15,18-21,31-35,38-45,47 and 49-54* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *34,35 and 38-42* is/are allowed.

6)☒ Claim(s) *1,3,5,7,8,13,15,31-33,43-45,47 and 49-54* is/are rejected.

7)☒ Claim(s) *2,9-12,14 and 18-21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some *   c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Table of Contents

Continued Examination Under 37 C.F.R. § 1.114

[1]   A request for continued examination (RCE) under 37 C.F.R. § 1.114, including the fee set forth in 37 C.F.R. § 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 C.F.R. § 1.114, and the fee set forth in 37 C.F.R. § 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 C.F.R. § 1.114. Applicant's submission filed on Apr. 13, 2010 has been entered.

Information Disclosure Statement

[2]   The information disclosure statement (IDS) filed Apr. 13, 2010 complies with the provisions of 37 C.F.R. § 1.97, 1.98 and M.P.E.P. § 609. It has been placed in the application file, and the information referred to therein has been considered as to the merits.

Amendments & Claim Status

[3]   This Detailed Action is responsive to the RCE and IDS received Apr. 13, 2010. Claims 1-3, 5, 7-15, 18-21, 31-35, 38-45, 47, and 49-54 remain pending.

Claim Rejections - 35 U.S.C. § 101

[4]   35 U.S.C. § 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claimed Non-statutory Subject Matter of Computer Readable Medium

[5]   **Claims 43-45, 47,** and **49-54** are rejected under 35 U.S.C. § 101 as covering both non-statutory subject matter and statutory subject matter.[1]

Claims may be given their broadest reasonable interpretation consistent with the specification during proceedings before the USPTO.[2] The broadest reasonable interpretation of a claim drawn to a computer readable medium (also called machine readable medium and other such variations) typically covers forms of non-transitory tangible media and transitory propagating signals per se in view of the ordinary and customary meaning of computer readable media, particularly when the specification is silent.[3] When the broadest reasonable interpretation of a claim covers a signal per se, Claims 43-45, 47, and 49-54 are rejected under 35 U.S.C. § 101 as covering non-statutory subject matter.[4]

It is suggested to change Claims 43-45, 47, and 49-54 "machine-readable medium" to "non-transitory machine-readable medium". Such an amendment would typically not raise the issue of new matter, even when the specification is silent because the broadest reasonable interpretation relies on the ordinary and customary meaning that includes signals per se. The limited situations in which such an amendment could raise issues of new matter occur, for example, when the specification does not support a non-transitory embodiment because a signal

---

[1] *See* Subject Matter Eligibility of Computer Readable Media, 1351 OG 212, available at http://www.uspto.gov/web/offices/com/sol/og/2010/week08/TOC.htm#ref20.

[2] *See In re Zletz*, 893 F.2d 319 (Fed. Cir. 1989) (during patent examination the pending claims must be interpreted as broadly as their terms reasonably allow).

[3] *See* MPEP 2111.01.

[4] *See In re Nuijten*, 500 F.3d 1346, 1356-57 (Fed. Cir. 2007) (transitory embodiments are not directed to statutory subject matter) *and* Interim Examination Instructions for Evaluating Subject Matter Eligibility Under 35 U.S.C. § 101, Aug. 24, 2009; p. 2.

per se is the only viable embodiment such that the amended claim is impermissibly broadened

beyond the supporting disclosure.[5]

Claim Rejections - 35 U.S.C. § 103

[6]   The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

[7]   This application currently names joint inventors. In considering patentability of the

claims under § 103(a), the examiner presumes that the subject matter of the various Claims was

commonly owned at the time any inventions covered therein were made absent any evidence to

the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the

inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. § 103(c)

and potential 35 U.S.C. § 102(e), (f) or (g) prior art under § 103(a).

Frishman in view of Lee

[8]   **Claims 1, 3, 5, 7, 8, 13, 15, 31, 32, 43, 45, 47, 49** and **50** are rejected under § 103(a) as

being unpatentable over Frishman et al., U.S. Pub. No. 2003/0044080 ("Frishman") in view of

Lee et al., U.S. Pat. No. 6,539,060 ("Lee").

Regarding **Claim 1**, Frishman discloses a method for processing images (fig. 1)

compressed using block based compression ("compressed using one of the compression method

mentioned above" at ¶ 0012), comprising:

using a processor or computer (it is implicit the complex-computational method of

Frishman is performed by a computer including a processor) to perform the steps of:

---

[5] *See, e.g., Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473 (Fed. Cir. 1998).

determining whether two blocks are neighboring blocks of pixels (the 8 x 8 blocks of pixels in fig. 2 must have been determined to be neighboring to continue the fig. 5 algorithm at item 300 to block boundary classify edge pixel items P_8 and P_9);

determining whether the two neighboring blocks are both subdivided (edge pixel items P_5 through P_{12} undergo Threshold_1 at fig. 5, items 152, 302; if there is exists a pixel pair such that their difference is greater than Threshold_1, the block is subdivided; e.g., if $|P_{10}-P_{11}|>$Threshold_1, then the block containing edge pixel items P_{10}, P_{11} is subdivided; e.g., fig. 6c, top-right block is subdivided) if it is determined that the two blocks are neighboring blocks (fig. 6c, top-left and top-right blocks); and

performing deblocking filtering (fig. 5, item 156) on one or more edge pixels (at most edge pixel items P_4 though P_{13} after item 154 at fig. 5, in determining "ROI") of the two neighboring blocks (fig. 6c, top-left and top-right blocks), after determining that at least one of the two neighboring blocks is not subdivided (fig. 6c, top-left block is determined to be not subdivided when P_5 through P_8 differences all < Threshold_1);

using a first deblocking filter (e.g., "If the length of the filtered pixels ROI is less than 8 pixels, then the filter to be used. . .is a 5 Taps FIR filter. . ." at ¶ 0059) on one or more edge pixels of the two neighboring blocks if only one of the two neighboring blocks is subdivided (fig. 6c, top-left and top-right block is an example of a first deblocking filter used on all pixels marked "X", the top-right block subdivided, the top-left block not subdivided);

obtaining values of one or more edge pixels of the two neighboring blocks, if neither of the two neighboring blocks is subdivided ("if the length of the filtered pixels ROI is exactly 8 pixels" in ¶ 0059, which is a result of P_5 through P_{12} differences all < Threshold_1);

selecting a second deblocking filter (e.g., "Filter_1=[1 1 2 2 4 2 2 1 1]/16" at ¶ 0059);

using a second deblocking filter (e.g., "Filter_1=[1 1 2 2 4 2 2 1 1]/16" at ¶ 0059) on one or more edge pixels of the two neighboring blocks if neither of the two neighboring blocks is subdivided (though no example given in fig. 6, it is possible that all pixel item differences P_5 though P_{12} < Threshold_1 such that the top-right block of fig. 6c is symmetric with the top-left block of fig. 6c, both blocks not being subdivided, a second deblocking filter would be used different from the first deblocking filter),

Frishman does not disclose (i) obtaining one or more <u>difference values</u> of one or more edge pixels of the two neighboring blocks (if neither of the two neighboring blocks is subdivided); (ii) <u>comparing the one or more difference values to a second threshold</u>; (iii) selecting a second deblocking filter <u>based on the comparison</u> (of the one or more difference values to the second threshold); and (iv) thus using <u>that</u> second deblocking filter on one or more edge pixels in the last method-step of the claim.

Frishman instead uses a "static" filter such as "Filter_1=[1 1 2 2 4 2 2 1 1]/16" at ¶ 0059 not dependent on the difference values between neighboring pixels, "however any low pass filter having the same nature will also be suitable". Frishman at ¶ 0059.

Lee teaches an image post-processing method (fig. 1) that includes

(i) obtaining one or more difference values ("d=|D-C|" at fig. 6a) of one or more edge pixels (fig. 6a, items C, D) of the two neighboring blocks;

(ii) comparing the one or more difference values to a second threshold (QP at 9:53-10:10);

(iii) selecting a second deblocking filter based on the comparison of the one or more difference values to the second threshold (if |D-C|<QP, then "weak filtering" is performed as in fig. 6c; 9:53-10:10); and

(iv) thus using that second deblocking filter on one or more edge pixels (e.g., 6c, items A" to F").

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of Frishman to include (i) obtaining one or more <u>difference values</u> of one or more edge pixels of the two neighboring blocks (if neither of the two neighboring blocks is subdivided); (ii) <u>comparing the one or more difference values to a second threshold</u>; (iii) selecting a second deblocking filter <u>based on the comparison</u> (of the one or more difference values to the second threshold); and (iv) thus using <u>that</u> second deblocking filter on one or more edge pixels as taught by Lee "to reduce the 1-D artificial discontinuity" at 9:64-65. In addition, "to provide an image data post-processing method for reducing quantization effects such as blocking artifacts, corner outliers and ringing noise, from an MPEG-decompressed image, which can perform low bit rate coding without complex computation, and an apparatus therefor." Lee at 2:25-30.

Regarding **Claim 3**, Frishman discloses wherein determining whether two neighboring blocks are both subdivided comprises:

obtaining a block size assignment values (the block size assignment information is 8 x 8 already known by the algorithm); and

using the block size assignment value to determine whether the two neighboring values are subdivided (the algorithm "uses" the block size assignment value to determine whether the two neighboring values are subdivided).

Regarding **Claim 5,** Frishman in view of Lee does not disclose wherein using the second blocking filter comprises using a two point averaging filter on two edge pixels of the two neighboring blocks.

Lee teaches an image post-processing method (fig. 1) that includes a blocking filter using a two point averaging filter on two edge pixels of the two neighboring blocks (fig. 6c, items C", D").

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the second blocking filter of Frishman in view of Lee to include using a two point averaging filter on two edge pixels of the two neighboring blocks as taught by Lee "to reduce the 1-D artificial discontinuity" at 9:64-65. In addition, "to provide an image data post-processing method for reducing quantization effects such as blocking artifacts, corner outliers and ringing noise, from an MPEG-decompressed image, which can perform low bit rate coding without complex computation, and an apparatus therefor." Lee at 2:25-30.

Regarding **Claim 7,** Frishman in view of Lee does not disclose wherein obtaining one or more difference values comprises obtaining a first order difference between edge pixels of the two neighboring blocks.

Lee teaches an image post-processing method (fig. 1) that includes obtaining one or more difference values (fig. 6a; 9:53-10:10) comprises obtaining a first order difference (fig. 6b) between edge pixels (fig. 6b, items C', D') of the two neighboring blocks.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the obtaining one or more difference values of Frishman in view of Lee to include obtaining a first order difference between edge pixels of the two neighboring blocks as taught by Lee "to reduce the 1-D artificial discontinuity" at 9:64-65. In addition, "to provide an image data

post-processing method for reducing quantization effects such as blocking artifacts, corner outliers and ringing noise, from an MPEG-decompressed image, which can perform low bit rate coding without complex computation, and an apparatus therefor." Lee at 2:25-30.

Regarding **Claim 8,** Frishman in view of Lee does not disclose wherein obtaining one or more difference values comprises obtaining a second order difference between edge pixels of the two neighboring blocks.

Lee teaches an image post-processing method (fig. 1) that includes obtaining one or more difference values (fig. 6a; 9:53-10:10) comprises obtaining a second order difference (fig. 6c) between edge pixels (fig. 6c, items B'', C'', D'', E'') of the two neighboring blocks.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the obtaining one or more difference values of Frishman in view of Lee to include obtaining a second order difference between edge pixels of the two neighboring blocks as taught by Lee "to reduce the 1-D artificial discontinuity" at 9:64-65. In addition, "to provide an image data post-processing method for reducing quantization effects such as blocking artifacts, corner outliers and ringing noise, from an MPEG-decompressed image, which can perform low bit rate coding without complex computation, and an apparatus therefor." Lee at 2:25-30.

Regarding **Claim 13,** Frishman discloses an apparatus (it is implicit the complex-computational method of Frishman is performed by a computer including a processor) to process images compressed using block based compression with means-plus-function language (it is implicit the complex-computational method of Frishman is performed by a computer including software) to perform the method-steps as recited in Claim 1. Thus, references/arguments equivalent to those presented above for Claim 1 are equally applicable to Claim 13.

Regarding **Claim 15,** Claim 3 recites identical features as in Claim 15. Thus, references/arguments equivalent to those presented for Claim 3 are equally applicable to Claim 15.

Regarding **Claim 31,** Claim 1 recites identical features as in Claim 31. Thus, references/arguments equivalent to those presented for Claim 1 are equally applicable to Claim 31.

Regarding **Claim 32**, Claim 3 recites identical features as in Claim 32. Thus, references/arguments equivalent to those presented for Claim 3 are equally applicable to Claim 32.

Regarding **Claim 43**, Frishman discloses a machine-readable medium (it is implicit the complex-computational method of Frishman is performed by a computer including memory) comprising code (it is implicit the complex-computational method of Frishman is performed by a computer including programs) that when executed by a processor (it is implicit the complex-computational method of Frishman is performed by a computer including a processor) causes the processor to perform the method-steps as recited in Claim 1. Thus, references/arguments equivalent to those presented above for Claim 1 are equally applicable to Claim 43.

Regarding **Claim 45**, Claim 3 recites identical features as in Claim 45. Thus, references/arguments equivalent to those presented for Claim 3 are equally applicable to Claim 45.

Regarding **Claim 47**, Claim 5 recites identical features as in Claim 47. Thus, references/arguments equivalent to those presented for Claim 5 are equally applicable to Claim 47.

Regarding **Claim 49**, Claim 7 recites identical features as in Claim 49. Thus, references/arguments equivalent to those presented for Claim 7 are equally applicable to Claim 49.

Regarding **Claim 50**, Claim 8 recites identical features as in Claim 50. Thus, references/arguments equivalent to those presented for Claim 8 are equally applicable to Claim 50.

Frishman in view of Lee, and in further view of Thyagarajan

[9]   **Claim 33** are rejected under § 103(a) as being unpatentable over Frishman in view of Lee, and in further view of Thyagarajan et al., U.S. Patent No. 6,529,634 ("Thyagarajan").

Regarding **Claim 33**, Frishman in view of Lee does not disclose wherein the processor determines whether two neighboring blocks are divided based upon variance values of each block.

Thyagarajan teaches a contrast sensitive variance based adaptive block size DCT image compression (fig. 1) that includes determining whether two neighboring blocks (e.g., blocks P_{32} and P_{33} of fig. 3b are neighboring)are divided based upon variance values (e.g., "V4ij" in item 226 of fig. 2) of each block.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the determining whether two neighboring blocks are divided of Frishman in view of Lee to include based upon variance values of each block as taught by Thyagarajan because "[v]ariance based block size assignment offers several advantages. Because the Discrete Cosine Transform is performed after block sizes are determined, efficient computation is achieved. The computationally intensive transform need only be performed on the selected blocks. In addition, the block selection process is efficient, as the variance of pixel values is mathematically simple to calculate. Still another advantage of variance based block size assignment is that it is perceptually based. Pixel variance is a measure of the activity in a block, and provides indication of the presence of edges, textures, etc. It tends to capture the details of a block much better than measures such as the average of pixel values. Thus, the variance based scheme of the present invention assigns smaller blocks to regions with more edges and larger blocks to the flatter regions. As a result, outstanding quality may be achieved in the reconstructed images." Thyagarajan at 9-25.

Allowable Subject Matter

[10]   Claims 44 and 51-54 would be allowable if rewritten (i) to overcome the rejection(s) under 35 U.S.C. § 112, 2nd paragraph; and (ii) in independent form including all of the limitations of the base claim and any intervening claims to overcome the objection to as being dependent upon a rejected base claim.

[11]   Claims 2, 9-12, 14, and 19-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

[12]   Claims 34, 35, and 38-42 allowed.

Reasons for Indicating Allowable Subject Matter

[13]   The following is an examiner's statement of reasons for allowance:

Regarding **Claim 2**, the prior art of record does not teach determining whether the two
neighboring blocks are both subdivided based upon the comparison of the variance values to the
first threshold. Claims 14 and 44 would be allowable by analogy.

Regarding **Claim 9**, the prior art of record does not teach using a Gaussian filter if at least
two of the difference values are greater than a second threshold. Claims 18 and 51 would be
allowable by analogy. Claims 10-12, 19-21, and 52-54 would be allowable by dependency.

Regarding **Claim 34**, see Office Action at p. 7, Apr. 15, 2009 (pertaining to allowability
of Claim 34). Claims 35 and 38-42 would be allowable by dependency.

[14]   Any comments considered necessary by applicant must be submitted no later than the
payment of the issue fee and, to avoid processing delays, should preferably accompany the issue
fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for
Allowance."

Conclusion

[15]   Any inquiry concerning this communication or earlier communications from the
examiner should be directed to DAVID P. RASHID whose telephone number is (571)270-1578
and fax number (571)270-2578. The examiner can normally be reached Monday - Friday 7:30 -
17:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Bhavesh Mehta can be reached on (571) 272-74537453. The fax phone number for
the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent
Application Information Retrieval (PAIR) system. Status information for published applications
may be obtained from either Private PAIR or Public PAIR. Status information for unpublished
applications is available through Private PAIR only. For more information about the PAIR
system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR
system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated
information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Rashid/
Examiner, Art Unit 2624

David P Rashid
Examiner
Art Unit 26244